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UNION CARBIDE CORPORATION 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001

92 OCT -7 AM 8:15

8EHQ-92-12249

September 29, 1992 8892001068

INIT

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Document Processing Center (TS-790)
Room L-100
Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Attn: Section 8(e) Coordinator (CAP Agreement)

Re: CAP Agreement Identification No. 8ECAP-0110

Dear Sir or Madam:

Union Carbide Corporation ("Union Carbide") herewith submits the following report pursuant to the terms of the TSCA §8(e) Compliance Audit Program and Union Carbide's CAP Agreement dated August 14, 1991 (8ECAP-0110). This report describes acute toxicity studies with N-vinylethylenimine (CASRN [not available]).

"N-Vinylethylenimine: Range Finding Toxicity Studies", Chemical Hygiene Fellowship (Carnegie-Mellon University), Special Report 33-28, March 30, 1970.

A complete summary of this report is attached.

Previous TSCA Section 8(e) or "FYI" Submission(s) related to this substance are:

(None)

Previous PMN submissions related to this substance are: (None)

RECEIVED 8-19-94

33-28

(2)

This information is submitted in light of EPA's current guidance. Union Carbide does not necessarily agree that this information reasonably supports the conclusion that the subject chemical presents a substantial risk of injury to health or the environment.

In the attached report the term "CONFIDENTIAL" may appear. This precautionary statement was for internal use at the time of issuance of the report. Confidentiality is hereby waived for purposes of the needs of the Agency in assessing health and safety information. The Agency is advised, however, that the publication rights to the contained information are the property of Union Carbide.

Yours truly,

William C. Kuryla, Ph.D.
Associate Director
Product Safety
(203/794-5230)

WCK/cr
Attachment (3 copies of cover letter, summary, and report)

SUMMARY

(3)

Confidential
Special Report 33-28
5 Pages

R: 3-30-70

Chemical Hygiene Fellowship
MELLON INSTITUTE
Carnegie-Mellon University

N-Vinylethylenimine

Range Finding Toxicity Studies

Editor: C. S. Weil Contributors: N. I. Condra, E. R. Kinkead
For: UNION CARBIDE CORPORATION, Chemicals and Plastics Operations Division

Summary

Stomach Intubation, rat - LD50 = 0.0884 ml./kg. undiluted.

Skin Penetration, rabbit - LD50 = 0.0198 ml./kg. undiluted.

Inhalation, rat -
4 hours at 100 ppm. killed 6 of 6; at 50 ppm. killed 0 of 6
∴ LC50 = 70.7 (57.1 to 87.6) ppm.

Uncovered Skin Irritation, rabbit - severe, Grade 7.

Eye Injury, rabbit - severe, Grade 10.

SUMMARY

Peroral, Single Dose to Rats

LD_{50} - 0.0884 (0.0654 to 0.119) ml./kg. undiluted.

Conditions - standard.

Dosage; ml./kg.	Dead / Dosed	Days to Death	Weight Change	Signs and/or Symptoms
0.125	5/5	0,0,0,0,4	-	Prostrate within 5 minutes of dose.
0.0625	0/5	-	+76 to +112	

Confidential
Special Report 33-28
5 Pages

R: 3-30-70

Chemical Hygiene Fellowship
MELLON INSTITUTE
Carnegie-Mellon University

N-Vinylethylenimine

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Uncovered Skin Irritation, rabbit - severe, Grade 7.

Eye Injury, rabbit - severe, Grade 10.

Interpretation

N-Vinylethylenimine was highly toxic by the peroral route and seriously toxic by the skin penetration and inhalation routes. Necrosis of the skin resulted from the undiluted material or a 10% aqueous solution and severe eye injury was produced by the undiluted material or a 1% aqueous solution of it. N-Vinylethylenimine is a D.O.T., Class B poison by inhalation and by skin penetration.

Sample

Quantity: Approximately 6 ounces Date Received: 2-12-70 M. I. Sample No.: 33-17

Submitted by: R. K. Barnes Division: Research and Development South Charleston, W. Va.

Identification: liquid
Project No. 136I20

Peroral, Single Dose to Rats

LD_{50} - 0.0884 (0.0654 to 0.119) ml./kg. undiluted.

Conditions - standard.

Dosage; ml./kg.	Dead / Dosed	Days to Death	Weight Change	Signs and/or Symptoms
0.125	5/5	0,0,0,0,4	-	Prostrate within 5 minutes of dose.
0.0625	0/5	-	+76 to +112	

Gross Pathology - in victims, congestion of abdominal viscera, spotty hemorrhage of lungs and very dark, mottled livers.

Conclusions - highly toxic by acute peroral route.

Skin Penetration, Single Dose to Rabbits

LD_{50} - 0.0198 (0.0121 to 0.0324) ml./kg. undiluted.

Conditions - standard.

Dosage; ml./kg.	Dead / Dosed	Days to Death	Weight Change	Skin Irritation	Signs and/or Symptoms
0.05	2/2	1,2	-	necrosis and edema.	Some twitching of eyes, pupils large, convulsions before death.
0.025	3/4	1,1,1	+88		
0.0125	0/4	-	-130,+52, +104,+132		

Gross Pathology - in victims, congestion of lungs and abdominal viscera; livers mottled and acini prominent.

Conclusions - seriously toxic by acute, covered dermal route.

Inhalation, Single, by Rats

Conditions - Procedure D.

Procedure	Time	Concentration	Dead/Dosed	Days to Death	Weight Change	Signs and/or Symptoms
D	4 hrs.	100 ppm. (0.282 mg./L.)	6/6	1,1,1,1,1,1	-	Slight loss of coordination at 1.5 hours. Hyper-reactive at 4 hrs.
D	4 hrs.	50 ppm. (0.141 mg./L.)	0/6	-	+47 to +58	None.
D	1 hr.	2 mg./L.	6/6	1,1,1,1,1,1	-	Immediate irritation of eyes and nose. Slight loss of coordination at 20 minutes. Hyper-reactive at 1 hour.

Gross Pathology - victims - blood in intestines; slight hemorrhage of lungs.
Survivors - nothing remarkable.

Conclusions - LC50 = 70.7 (57.1 to 87.6) ppm. in 4 hours. A Class B, D.O.T., poison.

Skin Irritation, Rabbit, Uncovered

Conditions - standard.

Conclusions - necrosis resulted from application of the undiluted material or from a 10% aqueous solution; no irritation on 4 and moderate capillary injection on 1 rabbit resulted from application of a 1% aqueous solution. Grade 7.

Eye Irritation, Rabbit

Conditions - standard.

Conclusions - severe corneal injury and damage to the eyelids resulted from application of 0.005 ml. quantities, undiluted, or from 0.5 ml. quantities of a 1% aqueous solution. Grade 10.

Carrol S. Weil, M.A.
Senior Fellow

Approved:

Charles P. Carpenter, Ph.D.
Administrative Fellow

Acknowledgments:

Skin Penetration, Irritation Tests — Naomi I. Condra, B.S.
Junior Fellow

Inhalation Studies — Edwin R. Kinkead, B.S.
Junior Fellow

Typed: March 30, 1970 - md

Standard Test Procedures

In all tests, the nonfasted animals are maintained on appropriate Rockland diets and water ad lib except during period of manipulation or confinement. Dosage levels differ by a factor of 2 in a geometric series. LD50s or LC50s are calculated by the moving average method based on a 14-day observation period.

Peroral. Compounds administered by stomach intubation to Wistar derived male rats, 90-120 grams in weight and 3 to 4 weeks of age, reared in our own colony.

Skin Penetration. Male albino rabbits, 3 to 5 months of age, are immobilized during the 24-hour contact period with the compound retained under impervious sheeting on the clipped intact skin of the trunk. Thereafter, excess fluid is removed to prevent ingestion. Maximum dosage that can be retained is 20 ml./kg.

Inhalation. Procedure A. Concentrated vapor is generated in a gas washing bottle by passing dried air at 2.5 liters/min. through a fritted glass disc immersed to a depth of at least 1-1/2 inches in the chemical which is delivered to rats in a 9-liter glass exposure chamber. Mean vapor concentration is calculated from the loss in weight of the liquid or estimated from the vapor pressure at the actual temperature of the chemical during aeration.

Procedure B. Substantially saturated vapor is prepared by spreading 50 grams of chemical over 200 $cm.^2$ area on shallow tray placed near the top of a 120-liter glass chamber which is then sealed for at least 16 hours while an intermittently operated fan agitates the internal chamber atmosphere. Rats are then introduced in a gasketed drawer-type cage designed and operated to minimize vapor loss.

Procedure C. Mist, vapor and any oxidation or decomposition products of the chemical held at 170°C. are generated and delivered as in A.

Procedure D. Vapor at metered concentration, not checked analytically, is generated by feeding the liquid at a constant rate down the inside of a spirally corrugated surface of a minimally heated one inch Pyrex tube, through which metered air is passed. Resultant vapor is delivered as in A.

Procedure E. Spray - Solutions or suspensions are atomized in a glass VAPONEFRIN nebulizer using dried compressed air at 9 liters/min. (corrected) and 22 p.s.i. The resultant aerosol of droplets averaging 2 microns in diameter is conducted directly into a 60-liter cubic glass chamber containing rats. Mean aerosol concentration is calculated from the amount of material atomized.

Procedure F. Dust - Dust clouds are generated by a baffled Wright Dust Feed through which air is passed at 20 liters/min. (uncorrected) at 15 p.s.i. The dust is delivered directly to a 120-liter plexiglas chamber containing rats. Airborne dust concentrations are measured gravimetrically every half hour.

Skin Irritation. Chemical is applied in 0.01 ml. amounts to clipped, uncovered intact skin of 5 rabbit bellies either undiluted or in progressive dilutions of 10, 1, 0.1, and 0.01% in solvent. Ten grades are recognized based on appearance of moderate or marked capillary injection, erythema, edema or necrosis within 24 hours. No injury from undiluted = Grade 1.

Eye Irritation. Eyes not staining with 5% fluorescein in 20 seconds contact are accepted. Single instillation of 0.005, 0.02, 0.10 or 0.5 ml. undiluted or of 0.5 ml. of 40, 15, 5 and 1% dilutions are made into conjunctival sac of 5 rabbits. Read immediately unstained and after fluorescein at 24 hours, with ten grades recognized. Trace or no injury from 0.5 ml. undiluted = Grade 1.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

William C. Kuryla, Ph.D.
Assistant Director, Product Safety
Union Carbide Chemicals and Plastics Company Inc.
Health, Safety and Environmental Affairs
39 Old Ridgebury Road
Danbury, Connecticut 06817-0001

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MAR 0 6 1995

EPA acknowledges the receipt of information submitted by your organization under Section 8(e) of the Toxic Substances Control Act (TSCA). For your reference, copies of the first page(s) of your submission(s) are enclosed and display the TSCA §8(e) Document Control Number (e.g., 8EHQ-00-0000) assigned by EPA to your submission(s). Please cite the assigned 8(e) number when submitting follow-up or supplemental information and **refer to the reverse side of this page for "EPA Information Requests"** .

All TSCA 8(e) submissions are placed in the public files unless confidentiality is claimed according to the procedures outlined in Part X of EPA's TSCA §8(e) policy statement (43 FR 11110, March 16, 1978). Confidential submissions received pursuant to the TSCA §8(e) Compliance Audit Program (CAP) should already contain information supporting confidentiality claims. This information is required and should be submitted if not done so previously. To substantiate claims, submit responses to the questions in the enclosure "Support Information for Confidentiality Claims". This same enclosure is used to support confidentiality claims for non-CAP submissions.

Please address any further correspondence with the Agency related to this TSCA 8(e) submission to:

Document Processing Center (7407)
Attn: TSCA Section 8(e) Coordinator
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
Washington, D.C. 20460-0001

EPA looks forward to continued cooperation with your organization in its ongoing efforts to evaluate and manage potential risks posed by chemicals to health and the environment.

Sincerely,

Terry R. O'Bryan

Terry R. O'Bryan
Risk Analysis Branch

Enclosure 12249A

Triage of 8(e) Submissions

Date sent to triage: MAY 0 5 1995 NON-CAP (CAP)

Submission number: 12249A TSCA Inventory: Y N (D)

Study type (circle appropriate):

Group 1 - Dick Clements (1 copy total)

ECO AQUATO

Group 2 - Ernie Falke (1 copy total)

(ATOX) SBTOX SEN (w/NEUR)

Group 3 - Elizabeth Margosches (1 copy each)

STOX CTOX EPI RTOX GTOX

STOX/ONCO CTOX/ONCO IMMUNO CYTO NEUR

Other (FATE, EXPO, MET, etc.): _____

Notes:

THIS IS THE ORIGINAL 8(e) SUBMISSION; PLEASE REFILE AFTER TRIAGE DATABASE ENTRY

For Contractor Use Only

entire document: 0 1 2 **pages** 1, 2 **pages** 1-3, tabs

Notes:

Contractor reviewer : UPS **Date:** 12/30/94.

CECATS\TRIAGE TRACKING DBASE ENTRY FORM

CECATS DATA:
Submission # 8EHQ- 1092 - 12249 SEQ. A

TYPE: INT SUPP FLWP

SUBMITTER NAME: Union Carbide Corporation

SUB. DATE: 09/29/92 OTS DATE: 10/07/92 CSRAD DATE: 08/19/94

INFORMATION REQUESTED: FLWP DATE:
0501 NO INFO REQUESTED
0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)

DISPOSITION:
0639 REFER TO CHEMICAL SCREENING
0678 CAP NOTICE

VOLUNTARY ACTIONS:
0401 NO ACTION REPORTED
0402 STUDIES PLANNED/UNDERWAY
0403 NOTIFICATION OF WORKERS/OTHERS
0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP./USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
0408 CONFIDENTIAL

CHEMICAL NAME: N - Vinylethylenimine

CAS# ~~Unknown~~ 5628-99-9

INFORMATION TYPE:		P F C
0201	ONCO (HUMAN)	01 02 04
0202	ONCO (ANIMAL)	01 02 04
0203	CELL TRANS (IN VITRO)	01 02 04
0204	MUTA (IN VITRO)	01 02 04
0205	MUTA (IN VIVO)	01 02 04
0206	REPRO/TERATO (HUMAN)	01 02 04
0207	REPRO/TERATO (ANIMAL)	01 02 04
0208	NEURO (HUMAN)	01 02 04
0209	NEURO (ANIMAL)	01 02 04
0210	ACUTE TOX. (HUMAN)	01 02 04
0211	CHR. TOX. (HUMAN)	01 02 04
0212	ACUTE TOX. (ANIMAL)	01 02 04
0213	SUB ACUTE TOX (ANIMAL)	01 02 04
0214	SUB CHRONIC TOX (ANIMAL)	01 02 04
0215	CHRONIC TOX (ANIMAL)	01 02 04

INFORMATION TYPE:		P F C
0216	EPI/CLIN	01 02 04
0217	HUMAN EXPOS (PROD CONTAM)	01 02 04
0218	HUMAN EXPOS (ACCIDENTAL)	01 02 04
0219	HUMAN EXPOS (MONITORING)	01 02 04
0220	ECO/AQUA TOX	01 02 04
0221	ENV. OCCC/REL/FATE	01 02 04
0222	EMER INCI OF ENV CONTAM	01 02 04
0223	RESPONSE REQEST DELAY	01 02 04
0224	PROD/COMP/CHEM ID	01 02 04
0225	REPORTING RATIONALE	01 02 04
0226	CONFIDENTIAL	01 02 04
0227	ALLERG (HUMAN)	01 02 04
0228	ALLERG (ANIMAL)	01 02 04
0239	METAB/PHARMACO (ANIMAL)	01 02 04
0240	METAB/PHARMACO (HUMAN)	01 02 04

INFORMATION TYPE:		P F C
0241	IMMUNO (ANIMAL)	01 02 04
0242	IMMUNO (HUMAN)	01 02 04
0243	CHEM/PHYS PROP	01 02 04
0244	CLASTO (IN VITRO)	01 02 04
0245	CLASTO (ANIMAL)	01 02 04
0246	CLASTO (HUMAN)	01 02 04
0247	DNA DAM/REPAIR	01 02 04
0248	PROD/USE/PROC	01 02 04
0251	MSDS	01 02 04
0299	OTHER	01 02 04

TRIAGE DATA: NON-CBI INVENTORY

CAS SR

NO

DETERMINE

ONGOING REVIEW

YES (DROP/REFER)

NO (CONTINUE)

REFER:

SPECIES

RAT

RBT

TOXICOLOGICAL CONCERN:

LOW

MED

HIGH

USE:

PRODUCTION:

COMMENTS:

-CPSS- 0927952113

0 0 0 0 0 0 0 0 0 0 0
> <ID NUMBER>
8(E)-12249A

> <TOX CONCERN>
M/H

> <COMMENT>
ACUTE DERMAL TOXICITY IN RABBITS IS HIGH CONCERN BASED ON AN LD50 OF 0.0198 ML/KG FOR UNDILUTED TEST MATERIAL. DOSE (ML/KG) AND MORTALITY: 0.05 (2/2), 0.025 (3/4), AND 0.0125 (0/4). CLINICAL SIGNS INCLUDED NECROSIS AND EDEMA AT THE HIGHEST DOSE LEVEL AND WEIGHT CHANGES AT THE LOWER DOSE LEVELS. THERE WERE ALSO SIGNS OF EYE TWITCHING, LARGE PUPILS AND CONVULSIONS IN THE HIGH DOSE GROUP. PATHOLOGICAL CHANGES IN DECEDENTS INCLUDED CONGESTION OF LUNGS, ABDOMINAL VISCERA, LIVERS MOTTLED AND ACINI PROMINENT.

ACUTE INHALATION TOXICITY IN RATS FOR A 4 HOUR EXPOSURE IS HIGH CONCERN BASED ON AN LC50 OF 70.7 PPM. DOSE (PPM) AND MORTALITY: 100 (6/6) AND 50 (0/6). CLINICAL SIGNS WERE NOTED AT 100 PPM AND CONSISTED OF SLIGHT LOSS OF COORDINATION AND HYPER-REACTIVITY. IN ANOTHER INHALATION STUDY, RATS WERE EXPOSED FOR 1 HOUR TO 2 MG/L OF TEST MATERIAL. THERE WAS 100% MORTALITY (6/6). CLINICAL SIGNS INCLUDED IMMEDIATE EYE AND NOSE IRRITATION, SLIGHT LOSS OF COORDINATION, AND HYPER-REACTIVITY. PATHOLOGY OF DECEDENTS FOR BOTH STUDIES REVEALED BLOOD IN INTESTINES, AND SLIGHT HEMORRHAGES OF LUNGS.

SKIN IRRITATION IN RABBITS IS HIGH CONCERN. WHEN 0.01 ML OF TEST MATERIAL WAS ADMINISTERED IT CAUSED SEVERE IRRITATION AND IS CONSIDERED GRADE 7. NECROSIS OCCURRED WHEN UNDILUTED OR A 10% AQUEOUS SOLUTION OF TEST MATERIAL WAS ADMINISTERED. 1 ANIMAL EXHIBITED MODERATE CAPILLARY INJECTION FROM A 1% AQUEOUS SOLUTION.

EYE IRRITATION IN RABBITS IS HIGH CONCERN. TEST MATERIAL CAUSED SEVERE IRRITATION AND IS CONSIDERED GRADE 10. CORNEAL INJURY AND DAMAGE TO THE EYELIDS OCCURRED WHEN 0.05 ML OF UNDILUTED OR 0.5 ML OF A 10% AQUEOUS SOLUTION WERE ADMINISTERED.

ACUTE ORAL TOXICITY IN RATS IS MEDIUM CONCERN BASED ON AN LD50 OF 0.0884 ML/KG. DOSE (ML/KG) AND MORTALITY: 0.125 (5/5) AND 0.0625 (0/5). CLINICAL SIGNS INCLUDED PROSTRATION (0.125 ML/KG) AND WEIGHT GAIN (0.0625 ML/KG). PATHOLOGICAL CHANGES WERE NOTED AT 0.125 ML/KG AND CONSISTED OF CONGESTION OF ABDOMINAL VISCERA, SPOTTY HEMORRHAGE OF LUNGS AND VERY DARK, MOTTLED LIVERS.

$$$$